

A NEW SPECIES OF THE GENUS *TETRALEURODES* COCKERELL
(HEMIPTERA: ALEYRODIDAE) OF INDIA, WITH A KEY TO THE INDIAN SPECIES

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The whitefly genus *Tetraleurodes* Cockerell from India is reviewed. A new species *Tetraleurodes thassammaiae* breeding on *Actinodaphne* sp. in Singampara (Palakkad), Kerala, India, is described and illustrated. A key to the Indian species of the genus is given.

Key words: Whiteflies, Hemiptera, *Tetraleurodes*

INTRODUCTION

The whitefly genus *Tetraleurodes* Cockerell is represented by 69 described species almost worldwide (Martin and Mound 2007). In India, this genus is so far represented by seven species. A new species of this genus from southern India breeding on *Actinodaphne* sp. in Singampara (Palakkad), Kerala, India, is described with a key to the Indian species in this paper.

1. *Tetraleurodes bambusae* Jesudasan & David

Tetraleurodes bambusae Jesudasan and David 1991. *Oriental Ins.* 25: 332.

Material Examined: INDIA: Goa (Qupem): 5 puparia on *Oxytenanthera stocksii*, 21.ix.2008, R. Sundararaj.

Host: *Bambusa* sp. (Jesudasan and David 1991); *Oxytenanthera stocksii* (new host record).

Distribution: INDIA: Tamil Nadu (Jesudasan and David 1991); Goa (new distribution record).

Discussion: This species is rather distinct from the other species of *Tetraleurodes* in possessing sculptures on the dorsum.

2. *Tetraleurodes burliarensis* Jesudasan & David

Tetraleurodes burliarensis Jesudasan and David 1991. *Oriental Ins.* 25: 332-333.

Material Examined: INDIA: Tamil Nadu (Burliar): holotype puparium, on unidentified tree, 20.vi.1985, R.W.A. Jesudasan.

Host: Unidentified tree (Jesudasan and David 1991).

Distribution: INDIA: Tamil Nadu (Jesudasan and David 1991).

Discussion: The puparium of this species can be easily recognized by the absence of dorsal, mesothoracic and metathoracic setae.

3. *Tetraleurodes dendrocalamae* Dubey & Sundararaj

Tetraleurodes dendrocalamae Dubey and Sundararaj 2005. *Zoos' Print Journal* 20(7): 1924-1926.

Material Examined: INDIA: Karnataka (Kudremukh National Park): holotype puparium, on *Dendrocalamus strictus*, 10.viii.2001, A.K. Dubey.

Host: *Dendrocalamus strictus* (Dubey and Sundararaj 2005).

Distribution: INDIA: Karnataka (Dubey and Sundararaj 2005).

Discussion: This species can be easily separated from the other known Indian species by the presence of submedian setae on meso- and metathorax and submargin with a row of microtubercles.

4. *Tetraleurodes kunnathoorensis* Regu & David

Tetraleurodes kunnathoorensis Regu and David, 1993. *Hexapoda* 5(1): 53-56.

Material Examined: INDIA: Tamil Nadu (Kunnathoor): holotype puparium, on *Streblus asper*, 21.i.1991, K. Regu.

Host: *Streblus asper* (Regu and David 1993).

Distribution: INDIA: Tamil Nadu: Kunnathoor (Regu and David 1993).

Discussion: The puparium of this species is readily recognizable by the presence of submarginal setae in 5 pairs and subdorsal setae in 10 pairs.

5. *Tetraleurodes pusana* Takahashi

Tetraleurodes pusana Takahashi 1950. *Annot. Zool. Japan* 23: 86.

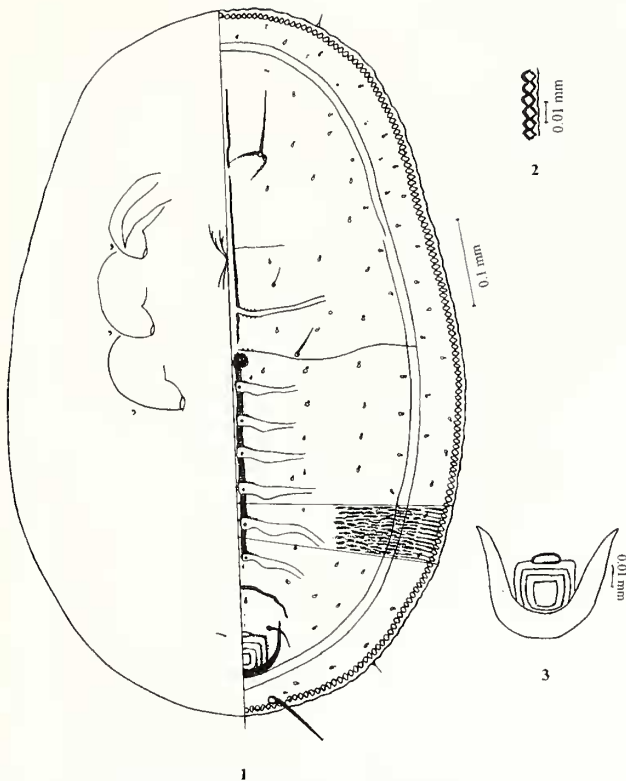
Tetraleurodes pusana Jesudasan and David, 1991. *Oriental Ins.* 25: 333.

Material Examined: INDIA: Tamil Nadu (Madras): 1 puparium on grass, 5.xii.1971, B.V. David.

Host: Unidentified Grass (Takahashi 1950).

Distribution: INDIA: Bihar (Pusa) (Takahashi 1950); Tamil Nadu (Jesudasan and David 1991).

Discussion: Yellowish-brown puparium with no wax and presence of long cephalic and metathoracic setae and dorsum without granules and sculptures serve to distinguish this species from other Indian species of *Tetraleurodes*.



Figs 1-3: *Tetraleurodes thassammaiae* sp. nov.
1. Puparium, 2. Margin, 3. Vasiform orifice

6. *Tetraleurodes rubiphagus* David & David

Tetraleurodes rubiphagus David and David 2007.
Oriental Ins. 41: 406.

Material Examined: INDIA: Tamil Nadu (Kalakkad): holotype puparium on unidentified plant, 1.v.1993, P.M.M. David.

Host: Unidentified Plant (David and David 2007).

Distribution: INDIA: Tamil Nadu (David and David 2007).

Discussion: This species can be distinguished from other known Indian species by the presence of fine wax filaments on the dorsal disc of the puparium and by the presence of at least 3 pairs of submarginal setae and by the absence of dorsal setae.

7. *Tetraleurodes thenmozhaiae* Jesudasan & David

Tetraleurodes thenmozhaiae Jesudasan and David 1991.
Oriental Ins. 25: 333-334.

Material Examined: INDIA: Tamil Nadu (Burliar): holotype puparium on *Cinnamomum* sp., 20.vi.1985, R.W. Alexander Jesudasan.

Host: *Cinnamomum* sp. (Jesudasan and David 1991).

Distribution: INDIA: Tamil Nadu (Jesudasan and David 1991).

Discussion: This species is distinguished from other

Indian species of *Tetraleurodes* by its white puparium with a distinct suture-like line running from the cephalothoracic region to eighth abdominal segment on subdorsum.

8. *Tetraleurodes thassammaiae* sp. nov.

Sundararaj & Pushpa (Figs 1-3)

Description

Puparium: White, without secretion of wax; elliptical, broadest at first abdominal segment region; 0.84-0.86 mm long, 0.52-0.58 mm wide; found in groups on the lower surface of leaves. Margin toothed, teeth rugose and arranged in two rows, 16-18 teeth in 0.1 mm. Thoracic and caudal tracheal pores not differentiated from margin. Anterior and posterior marginal setae each 6 μ m long.

Dorsum: Dorsum with rows of pores and porettes, subdorsum with faint wavy markings, submedian area smooth, segment sutures distinct, each abdominal segment suture with a ridged rim and a pair of microtubercle on submedian area, submedian pockets present in all abdominal segment sutures. Submargin separated from dorsal disc by a prominent complete submarginal furrow; submargin irregularly and faintly striated. A median longitudinal ridge extending from 7th abdominal segment towards cephalad parallel to the longitudinal moulting suture connecting abdominal segment sutures 1-6 and all thoracic segment sutures. A prominent median tubercle on 1st abdominal segment, microtubercles along the metathoracic and transverse moulting suture in the median area distinct. Longitudinal moulting suture reaching margin and transverse moulting suture reaching near submarginal furrow. Base of cephalic setae granulated.

Chaetotaxy: 6 pairs of setae – cephalic setae 80 μ m long, mesothoracic setae 10 μ m long, metathoracic setae 20 μ m long, first abdominal pseudosetae set close to the median line 2 μ m long, eighth abdominal setae cephalolateral of vasiform orifice 40 μ m long and caudal setae arising from submarginal microtubercle 75 μ m long. Vasiform orifice elevated, open, subrectangular, 54-56 μ m long, 40-50 μ m wide; operculum subrectangular, 28-38 μ m long, 20-24 μ m wide, lingula concealed. Thoracic and caudal tracheal furrows absent.

Venter: Paired ventral abdominal setae 14-18 μ m long, 50-54 μ m apart. Antennae reaching the base of prothoracic legs. Spiracles visible.

Host: *Actinodaphne* sp.

Distribution: INDIA: Kerala.

Material Examined: **Holotype:** One puparium, on *Actinodaphne* sp., mounted on slide, Coll. R. Sundararaj, 22.x.2006, deposited in the collection of Forest Research Institute, Dehradun (NFIC # 21888).

Type Locality: INDIA: Kerala: Singampara (Palakkad).

Paratypes: Eight mounted puparia, data same as holotype, deposited one each in the collections of Division of Entomology, Indian Agricultural Research Institute, New Delhi; Zoological Survey of India, Kolkata (2447/H15) and the remaining in the collection of Institute of Wood Science & Technology, Bengaluru.

Discussion: This species can be readily recognised from other known species of *Tetraleurodes* in the presence of mesothoracic and metathoracic setae, first abdominal pseudosetae and subrectangular vasiform orifice, but differs in shape and by the absence of microtubercles on dorsum.

Etymology: Named after Smt. Thassammai, mother of the senior author.

KEY TO THE INDIAN SPECIES OF *TETRALEURODES*

1. Puparium black or bluish black 2
- Puparium pale yellow or yellowish brown or white 5
2. Dorsal setae/meso-, metathoracic setae/submarginal/subdorsal setae present 3
- Dorsal setae/meso-, metathoracic setae/submarginal/subdorsal setae absent *burliarensis* Jesudasan & David
3. Submedian setae on meso- and metathorax absent; submargin without a row of microtubercles; vasiform orifice cordate or subcordate; 8-10 teeth in 0.1 mm 4
- Submedian setae on meso- and metathorax present; submargin with a row of microtubercles; vasiform orifice subrectangular; 16-18 teeth in 0.1 mm *dendrocalamae* Dubey & Sundararaj
4. Puparium with fine wax filaments present only on dorsal disc in nearly 3 circles, but absent from margin; minute submarginal setae at least 3 pairs; subdorsal setae absent; submargin devoid of polygonal to rounded markings *rubiphagus* David & David

- Puparium with very little wax around margin and on dorsum; submarginal setae in 5 pairs; subdorsal setae in 10 pairs; subdorsum with dense polygonal to rounded markings *kunnathoorensis* Regu & David
- 5. Puparium pale yellow or yellowish brown; only metathoracic setae present; submarginal furrow incomplete; first abdominal segment without a median tubercle 6
- Puparium white; meso and metathoracic setae present; submarginal furrow complete; first abdominal segment with a median tubercle *thassammaiae* sp. nov.
- 6. Puparium pale yellow with wax around margin; cephalic and metathoracic setae short; dorsum with granules and sculptures 7
- Puparium yellowish brown with no wax; cephalic and metathoracic setae very long; dorsum without granules and sculptures *pusana* Takahashi
- 7. Dark brown patch on dorsum absent; marginal setae wanting; cephalic setae 17.5 µm long, metathoracic setae 12.5-15.0 µm long and eighth abdominal setae 17.5 µm long; vasiform orifice wider than long *thenmozhaie* Jesudasan & David
- A distinct dark brown patch on dorsum present; marginal setae present; cephalic setae 38 µm long, metathoracic setae 43.7 µm long and eighth abdominal setae 27.5-40.0 µm long; vasiform orifice as long as wide *bambusae* Jesudasan & David

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